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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,577	06/15/2005	Xuemei Quyang	PHUS020608	9017

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EXAMINER
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MITCHELL, DANIEL D

ART UNIT	PAPER NUMBER
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4134

MAIL DATE	DELIVERY MODE
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05/23/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/538,577	<b>Applicant(s)</b> QUYANG ET AL.	
	<b>Examiner</b> DANIEL MITCHELL	<b>Art Unit</b> 4134	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/15/2005</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 6 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. PG Publication No. 2002/0003774 A1 to Wang et al. ("Wang") in view of U.S. PG Publication No. 2003/0123381 A1 to Zhuang et al ("Zhuang").

3. As to **claim 1**, Wang teaches an OFDM transmitter (page 2, paragraph 21-22 and fig. 1- element 1 teaches an OFDM transmitter), comprising: a diversity encoding stage (page 2, paragraph 22 and fig.1 – element 3 teaches an encoding stage) including means for splitting a data input signal into a first OFDM subcarrier stream and a second OFDM subcarrier stream (page 2, paragraph 23 teaches the encoding means separating a single data stream into two data streams), said diversity encoding stage further operable to implement a cross subcarrier transmitter diversity encoding of the first OFDM subcarrier stream and the second OFDM subcarrier stream to thereby generate a first encoded OFDM subcarrier stream and a second encoded OFDM subcarrier stream (page 3, paragraph 23 teaches an encoder that encodes a data stream on the basis of a transmit diversity scheme and outputting a first and a second encoded data stream where a first data stream will be transmitted by a first antenna and a second data stream will be transmitted by a second antenna).

Wang does not expressly disclose an OFDM symbol stage including means for transforming the first encoded OFDM subcarrier stream into a first modulated transmitter signal, said OFDM symbol stage operable to transform the second encoded OFDM subcarrier stream into a second modulated transmitter signal.

Zhuang teaches a stage that follows an encoder stage that modulates the encoded bit streams, where the modulator is capable of processing with OFDM techniques (page 3, paragraph 16 and fig. 2 element 21 reveals an encoder, element 23, 24 are OFDM modulators, and element 25, 26 are transmitters)

At the time of invention, it would have been obvious to a person of ordinary skill in the art to have modified Wang by transforming an encoded data stream into a modulated transmitter signal as taught by Zhuang. The suggestion/motivation would have been to support data transmission among transmitters that have minimal correlation (page 1, paragraph 13).

As to **claim 6**, see similar rejection as claim 1.

As to **claim 7**, see similar rejection as claim 1.

4. **Claims 2-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. PG Publication No. 2002/0003774 A1 to Wang et al. ("Wang") and U.S. PG Publication No. 2003/0123381 A1 to Zhuang et al. ("Zhuang") in view of U.S. PG Publication No. 2003/00722254 A1 to Ma *et al.* ("Ma").

As to **claim 2**, Wang and Zhuang disclose an OFDM Transmitter as to the parent claim.

*Wang and Zhuang* do not expressly disclose wherein said first OFDM subcarrier stream includes odd symbols of the data input signal.

*Ma* discloses an encoder that separates the data symbols of a single data stream into a first processing path and a second processing path by sending alternating data symbols along each of the two processing paths (page 4, paragraphs 61-64 - Therefore all odd symbols will go to one processing path and all even symbols will go the other processing path).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to have modified *Wang and Zhuang* by sending alternating symbols of a data stream to two processing paths. The suggestion/motivation would have been to have the symbols represent a component of a different orthogonal frequency which allows parallel transmission of data containing the data to be of longer duration, which reduces the effects of multi-path fading (*Zhuang* - page 1, paragraph 4).

As to **claim 3**, *Wang and Zhuang* disclose an OFDM Transmitter as to the parent claim.

*Wang and Zhuang* do not expressly disclose wherein said first OFDM subcarrier stream includes even symbols of the data input signal.

*Ma* discloses an encoder that separates the data symbols of a single data stream into a first processing path and a second processing path by sending alternate data symbols along each of the two processing paths (page 4,

paragraphs 61-64 - Therefore all odd symbols will go to one processing path and all even symbols will go the other processing path).

See similar motivation as claim 2.

As to **claim 4**, Wang and Zhuang teach the OFDM transmitter of claim 1, wherein said first encoded OFDM subcarrier stream includes multiple symbol pairings (Wang - page 3, paragraph 23 teaches a symbol pair as a data block), each symbol pairing having a complex conjugate symbol of said first OFDM subcarrier stream and a negative complex conjugate symbol of said second OFDM subcarrier stream over adjacent frequency bins (Wang - page 2, paragraph 23 and fig. 1 teaches a first data symbol  $S_{\text{sub.1}}$  in a time period  $0-T$  and a second data symbol  $S_{\text{sub.2}}$  in the succeeding time period  $T-2T$  are supplied to the encoding means, the first data stream output by the encoding means can identically correspond to that arrangement (data symbol  $S_{\text{sub.1}}$  followed by data symbol  $S_{\text{sub.2}}$ ). The second data stream output by the encoding means, however, contains the data symbols  $S_{\text{sub.1}}$  and  $S_{\text{sub.2}}$  in a different arrangement. For example, as shown in FIG. 1, in the second data stream, the data symbol of the first time period  $0-T$  could be the negative complex conjugated value of the second data block  $S_{\text{sub.2}}$  of the first data stream, i.e.  $-S_{\text{sub.2}}^*$ . The next succeeding data symbol of the second data stream is the conjugated complex value of the first data symbol  $S_{\text{sub.1}}$  of the first data stream, i.e.  $S_{\text{sub.1}}^*$ . Thus, the second data stream contains the identical data content as the first data stream, but in a different arrangement).

As to **claim 5**, see similar rejection as claim 4

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL MITCHELL whose telephone number is (571)270-5307. The examiner can normally be reached on Monday - Friday 8:00 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lao Lun-yi can be reached on 571-272-7671. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. M./  
Examiner, Art Unit 4134

/LUN-YI LAO/  
Supervisory Patent Examiner, Art Unit 4134

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